

What is claimed is:

1. A digital broadcast system allowing a transmitter to broadcast a set of linked content elements, a receiver to select a content element from a set of transmitted content elements for output, and a viewer to switch to a content element selected in response to an operation input by the viewer;
- said digital broadcast system comprising a transmitter and a receiver,
- said transmitter transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output, and
- said receiver comprising
- a receiving portion for receiving transmitted data,
- an operation receiving portion for receiving an operator operation, and
- a restoring portion for determining which content element to restore next based on the operation received by the operation receiving portion and in accordance with the navigation control data, for selecting a content element to be restored next out of content elements transmitted repeatedly, and for restoring the element for output, in a receiving mode; for restoring and recording a set of navigation control data and a set of content elements, in a recording mode; and for selecting a content element from a set of recorded content elements for output, based on the operation received by the operation receiving portion and in accordance with the recorded navigation control data, in a reproducing mode.
2. The digital broadcast system according to Claim 1, wherein
- said transmitter transmits sets of content elements as elementary streams to which a series of sequential information are attached, and transmits repeatedly fetch control data which fetches each of the content elements from said elementary streams in accordance with said series of information with the fetch control data associated with the content elements; and
- the restoring portion of said receiver fetches a target content element

from the elementary streams in accordance with the series of information of said fetch control data in the receiving mode and recording mode.

3. The digital broadcast system according to Claim 2, wherein
time information is utilized as said series of information, and
said content elements are dynamic video image data or audio data which
are sliced in said elementary streams in accordance with a start time and
termination time of said time information.

4. The digital broadcast system according to Claim 2, wherein
time information is utilized as said series of information, and
said content elements are still video image data which are sliced in said
elementary streams in accordance with said time information.

5. The digital broadcast system according to Claim 1, wherein
said transmitter associates a content element list which shows a list of
content elements included in the sets of content elements with the sets of
content elements and transmits the content element list, and
said restoring portion of said receiver determines whether or not all
content elements included in the sets of content elements have been recorded,
in accordance with said content element list in the recording mode.

6. The digital broadcast system according to Claim 1, wherein
said transmitter associates a navigation list which shows a list of
navigation control data included in the sets of navigation control data with the
sets of navigation control data and transmits the navigation list, and
said restoring portion of said receiver determines whether or not all
navigation control data included in the sets of the navigation data have been
recorded, in accordance with said navigation list in the recording mode.

7. The digital broadcast system according to Claim 1, wherein

said transmitter attaches an expiration date to a set of content elements or a set of fetch control data for transmission thereof, and

the restoring portion of said receiver associates said expiration date with a set of content elements for recording thereof in the recording mode, and does
5 not output said set of content elements if said expiration date has expired or outputs the same together with information that said expiration date has expired, in the reproducing mode.

8. The digital broadcast system according to Claim 1, wherein

10 said transmitter attaches an expiration date to content elements or fetch control data for transmission thereof, and

the restoring portion of said receiver associates said expiration date with content elements for recording thereof in the recording mode, and does not
15 same together with information that said expiration date has expired, in the reproducing mode.

9. The digital broadcast system according to Claim 7, wherein

said expiration date is included in a content element list or a navigation
20 list for transmission thereof.

10. A digital broadcast receiver which allows a viewer to switch to content elements selected in response to an operation input by the viewer,

said digital broadcast receiver comprising

25 a receiving portion for receiving transmitted data,

an operation receiving portion for receiving an operator operation, and

a restoring portion for determining which content element to restore next

based on the operation received by the operation receiving portion and in accordance with the navigation control data, for selecting a content element to

30 be restored next out of content elements transmitted repeatedly, and for restoring the element for output, in a receiving mode; for restoring and recording a set of

navigation control data and a set of content elements, in a recording mode; and for selecting a content element from a set of content elements for output, based on the operation received by the operation receiving portion and in accordance with the recorded navigation control data, in a reproducing mode.

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11. The digital broadcast receiver according to Claim 10, wherein
said restoring portion fetches a target content element from elementary
streams in accordance with fetch control data for identifying content elements
with a series of sequential information attached thereto in accordance with said
10 series of information, in the receiving mode and recording mode.

12. The digital broadcast receiver according to Claim 11, wherein
time information is utilized as said series of information, and
said content elements are dynamic video image data or audio data which
15 are sliced in said elementary streams in accordance with a start time and
termination time of said time information.

13. The digital broadcast receiver according to Claim 11, wherein
time information is utilized as said series of information, and
20 said content elements are still video image data which are sliced in said
elementary streams in accordance with said time information.

14. The digital broadcast receiver according to Claim 10, wherein
said restoring portion determines whether or not all content elements
25 included in the sets of content elements have been recorded, in accordance with
a received content element list in the recording mode.

15. The digital broadcast receiver according to Claim 10, wherein
said restoring portion determines whether or not all navigation control
30 data included in sets of navigation data have been recorded, in accordance with
a received navigation list in the recording mode.

16. The digital broadcast receiver according to Claim 10, wherein
said restoring portion fetches all target fetch control data without
specifying which fetch control data to fetch, and records content elements in
sequence in the order of obtaining fetch control data, in the recording mode.

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17. The digital broadcast receiver according to Claim 10, wherein
said restoring portion fetches all target navigation control data without
specifying which navigation control data to fetch, and records navigation control
data in sequence in the order of obtaining navigation control data, in the
10 recording mode.

18. The digital broadcast receiver according to Claim 10, wherein
said restoring portion in the recording mode fetches all target fetch
control data without specifying which fetch control data to fetch, and records
15 content elements in sequence in the order of obtaining fetch control data while
a number of unrecorded fetch control data remains, and
when a small number of unrecorded fetch control data remains, specifies
said unrecorded fetch control data in order to be fetched and recorded.

19. The digital broadcast receiver according to Claim 10, wherein
said restoring portion in the recording mode fetches all target navigation
control data without specifying which navigation control data to fetch, and
records content elements in sequence in the order of obtaining navigation control
data while a number of unrecorded navigation control data remains, and
20 when a small number of unrecorded navigation control data remains,
specifies said unrecorded navigation control data in order to be fetched and
25 recorded.

20. The digital broadcast receiver according to Claim 10, wherein
30 said restoring portion associates an expiration date transmitted
corresponding to a set of content elements or a set of fetch control data with the

set of content elements for recording thereof in the recording mode; and does not output said set of content elements if said expiration date has expired or outputs the same together with information that said expiration date has expired, in the reproducing mode.

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21. The digital broadcast receiver according to Claim 10, wherein
said restoring portion associates an expiration date transmitted
corresponding to content elements or fetch control data with said content
elements for recording thereof in the recording mode; and does not output said
10 content elements if said expiration date has expired or outputs the same together
with information that said expiration date has expired, in the reproducing mode.

22. A digital broadcast recorder for recording digital broadcast which allows
a viewer to switch to content elements selected in response to an operation input
15 by the viewer,

said digital broadcast recorder comprising
a receiving portion for receiving transmitted data, and
a recording portion which fetches a target content element from
elementary streams in accordance with fetch control data for identifying content
20 elements with a series of sequential information attached thereto in accordance
with said series of information, and which restores a set of content elements for
recording thereof and as well records a set of navigation control data.

23. A digital broadcast receiver comprising
25 a receiving portion for receiving transport streams,
an operation receiving portion for receiving an operator operation,
a transport decoder for selecting at least desired navigation control data
and content elements from received transport streams in accordance with the
operator operation for output,
30 an extending decoder for extending output from the transport decoder,
a CPU for controlling each aforementioned portion,

a memory which records a program for determining control contents of said CPU, and

a recording portion for recording;

said digital broadcast receiver wherein

5 said program allows the CPU to perform processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring
10 the same for output by extending the same by means of the extending decoder, in the receiving mode; restores a set of navigation control data and a set of content elements for recording the same in the recording portion in a recording mode; and selecting a content element out of a recorded set of content elements in the reproducing mode, based on the operation received by the operation
15 receiving portion in accordance with the navigation control data recorded in the recording portion.

24. A recording medium which records a program for allowing a CPU to perform reception processing; the CPU controlling a receiving portion for
20 receiving transport streams, an operation receiving portion for receiving an operator operation, a transport decoder for selecting at least desired navigation control data and content elements from received transport streams in accordance with the operator operation for output, an extending decoder for extending output from the transport decoder, and a recording portion for
25 recording;

 said recording medium for recording a program which allows the CPU to perform processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next
30 out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring the same for output by extending the same by means of

the extending decoder, in the receiving mode; restoring a set of navigation control data and a set of content elements for recording the same in the recording portion in a recording mode; and selecting a content element out of a recorded set of content elements in the reproducing mode, based on the operation
5 received by the operation receiving portion in accordance with the navigation control data recorded in the recording portion.

25. A digital broadcast transmitter which transmits a set of linked content elements,

10 said digital broadcast transmitter

transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to output, and

15 associating a content element list showing a list of content elements included in sets of content elements with sets of content elements for transmission thereof.

26. A digital broadcast method which allows a set of linked content elements
20 to be broadcast from a transmitting side and which allows a content element at a receiving side to be selected out of transmitted set of content elements for output and a viewer to switch to content elements selected in response to the viewer operation input,

said digital broadcast method comprising the steps of:

25 transmitting said set of content elements repeatedly with a plurality of content elements as one set, and

transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to transmit, at said transmitting side; and, at said receiving side,

30 receiving transmitted data,

determining which content element to restore next based on the

operation of the viewer and in accordance with the navigation control data,
selecting a content element to be restored next out of content elements
transmitted repeatedly,

restoring the element for output, in a receiving mode;

5 restoring and recording a set of navigation control data and a set of
content elements, in a recording mode; and

selecting a content element from a set of recorded content elements for
output, based on the operation received by the operation receiving portion and
in accordance with the recorded navigation control data, in a reproducing mode.

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27. A digital broadcast system allowing a transmitter to broadcast a set of
content elements linked to one another by descriptions of the content elements
themselves, a receiver to select a content element from a set of transmitted
content elements for output, and a viewer to switch to a content element
15 selected in response to an operation input by the viewer;

said digital broadcast system comprising a transmitter and a receiver,

said transmitter transmitting said sets of content elements repeatedly with
a plurality of content elements as one set, and

said receiver comprising

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a receiving portion for receiving transmitted data,

an operation receiving portion for receiving an operator operation, and

a restoring portion for determining which content element to restore next

based on the operation received by the operation receiving portion and in
accordance with link information in the content elements, for selecting a content

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element to be restored next out of content elements transmitted repeatedly, and

for restoring the element for output, in a receiving mode; for restoring and
recording a set of content elements, in a recording mode; and for selecting a

content element from a set of recorded content elements for output, based on the
operation received by the operation receiving portion and in accordance with link

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information in the content elements, in a reproducing mode.

28. A digital broadcast receiver which allows a viewer to switch to content elements selected in response to an operation input by the viewer,
said digital broadcast receiver comprising
a receiving portion for receiving transmitted data,
5 an operation receiving portion for receiving an operator operation, and
a restoring portion for determining which content element to restore next
based on the operation received by the operation receiving portion and in
accordance with link information in the content elements, for selecting a content
element to be restored next out of content elements transmitted repeatedly, and
10 for restoring the element for output, in a receiving mode; for restoring and
recording a set of content elements, in a recording mode; and for selecting a
content element from a set of recorded content elements for output, based on the
operation received by the operation receiving portion and in accordance with link
information in the content elements, in a reproducing mode.

29. A digital broadcast system allowing a transmitter to broadcast a set of
linked content elements, a receiver to select a content element from a set of
transmitted content elements for output, and a viewer to switch to a content
element selected in response to an operation input by the viewer;

20 said digital broadcast system comprising a transmitter and a receiver,
said transmitter transmitting said sets of content elements repeatedly with
a plurality of content elements as one set, and transmitting repeatedly one or
more navigation control data for controlling to determine which of a plurality of
content elements to output, and

25 said receiver comprising
a receiving portion for receiving transmitted data,
an operation receiving portion for receiving an operator operation, and
a restoring portion for determining which content element to restore next
based on the operation received by the operation receiving portion and in
30 accordance with the navigation control data, for selecting a content element to
be restored next out of content elements transmitted repeatedly, and for restoring

the element for output; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with the processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

30. The digital broadcast system according to Claim 29, wherein

said transmitter transmits sets of content elements as elementary streams to which a series of sequential information is attached, and transmits repeatedly fetch control data which fetches each of the content elements from said elementary streams in accordance with said series of information with the fetch control data associated with the content elements; and

the restoring portion of said receiver fetches a target content element from the elementary streams in accordance with the series of information of said fetch control data.

31. The digital broadcast system according to Claim 29, wherein

time information is utilized as said series of information, and said content elements are dynamic video image data or audio data which are sliced in said elementary streams in accordance with a start time and termination time of said time information.

32. The digital broadcast system according to Claim 29, wherein

time information is utilized as said series of information, and said content elements are still video image data which are sliced in said elementary streams in accordance with said time information.

33. The digital broadcast system according to Claim 29, wherein

said transmitter associates a content element list which shows a list of

content elements included in the sets of content elements with the sets of content elements and transmits the content element list, and

said restoring portion of said receiver determines whether or not all content elements included in the sets of content elements have been recorded,
5 in accordance with said content element list.

34. The digital broadcast system according to Claim 29, wherein
said transmitter associates a navigation list which shows a list of navigation control data included in the sets of navigation control data with the
10 sets of navigation control data and transmits the navigation list, and

said restoring portion of said receiver determines whether or not all navigation control data included in the sets of the navigation data have been recorded, in accordance with said navigation list.

35. The digital broadcast system according to Claim 29, wherein
said transmitter attaches an associated expiration date or a version to a whole set of content elements or an individual content element for transmission thereof, and

the restoring portion of said receiver associates said expiration date or
20 version with a whole set of content elements or an individual content element for recording, and performs optimization processing in accordance with said expiration date or version.

36. The digital broadcast system according to Claim 35, wherein
25 the optimization processing performed by the restoring portion of said receiver causes, in the case where desired content elements determined in accordance with the operator operation have already been written, the recorded content elements not to be outputted or to be outputted together with the information that the expiration date has expired, when the expiration date of said
30 content elements has expired or if the version is not up to date.

37. The digital broadcast system according to Claim 35, wherein
the optimization processing performed by the restoring portion of said
receiver causes, in the case where desired content elements determined in
accordance with the operator operation have already been written, the recorded
5 content elements not to be outputted, and allows for selecting a desired content
element from a transmitted set of content elements to restore and output the
same, when the expiration date of said content elements has expired or if the
version is not up to date.

10 38. The digital broadcast system according to Claim 35, wherein
the optimization processing performed by the restoring portion of said
receiver performs comparison between a version transmitted associated with
content elements and a version already recorded or comparison between current
date and time and expiration date already recorded, and, if the expiration date
15 has expired or the version is not up to date, then allows again for restoring
transmitted content elements for recording thereof.

39. The digital broadcast system according to Claim 35, wherein
said transmitter transmits information regarding to whether or not a new
20 set of content elements or content elements having a subsequent version or
subsequent expiration date is to be transmitted, associated with a whole set of
content elements or individual content elements.

40. A digital broadcast receiver which allows a viewer to switch to content
25 elements selected in response to an operation input by the viewer,
said digital broadcast receiver comprising
a receiving portion for receiving transmitted data,
an operation receiving portion for receiving an operator operation, and
a restoring portion for determining which content element to restore next
30 based on the operation received by the operation receiving portion and in
accordance with the navigation control data, for selecting a content element to

be restored next out of content elements transmitted repeatedly, and for restoring the element for output; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with the processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

41. The digital broadcast system according to Claim 39, wherein said restoring portion fetches a target content element from elementary streams in accordance with fetch control data for identifying content elements with a series of sequential information attached thereto in accordance with said series of information, in the receiving mode and recording mode.

42. The digital broadcast system according to Claim 41, wherein time information is utilized as said series of information, and said content elements are dynamic video image data or audio data which are sliced in said elementary streams in accordance with a start time and termination time of said time information.

43. The digital broadcast receiver according to Claim 41, wherein time information is utilized as said series of information, and said content elements are still video image data which are sliced in said elementary streams in accordance with said time information.

44. The digital broadcast system according to Claim 40, wherein said restoring portion determines whether or not all content elements included in the sets of content elements have been recorded, in accordance with a received content element list.

45. The digital broadcast receiver according to Claim 40, wherein
said restoring portion determines whether or not all navigation control
data included in sets of navigation data have been recorded, in accordance with
a received navigation list.

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46. The digital broadcast receiver according to Claim 40, wherein
said restoring portion fetches all target fetch control data without
specifying which fetch control data to fetch, and records content elements in
sequence in the order of obtaining fetch control data.

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47. The digital broadcast receiver according to Claim 40, wherein
said restoring portion fetches all target navigation control data without
specifying which navigation control data to fetch, and records navigation control
data in sequence in the order of obtaining navigation control data.

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48. The digital broadcast receiver according to Claim 40, wherein
said restoring portion fetches all target fetch control data without
specifying which fetch control data to fetch, and records content elements in
sequence in the order of obtaining fetch control data while a number of
unrecorded fetch control data remains, and

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when a small number of unrecorded fetch control data remains, specifies
said unrecorded fetch control data in order to be fetched and recorded.

49. The digital broadcast receiver according to Claim 40, wherein
said restoring portion fetches all target navigation control data without
specifying which navigation control data to fetch, and records content elements
in sequence in the order of obtaining navigation control data while a number of
unrecorded navigation control data remains, and

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when a small number of unrecorded navigation control data remains,
specifies said unrecorded navigation control data in order to be fetched and
recorded.

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50. The digital broadcast receiver according to Claim 40, wherein
said restoring portion associates said expiration date or version, which is
transmitted associated with a whole set of content elements or an individual
content element, with a whole set of content elements or an individual content
5 element for recording, and performs optimization processing in accordance with
said expiration date or version.

51. The digital broadcast system according to Claim 50, wherein
the optimization processing performed by said restoring portion causes,
10 in the case where desired content elements determined in accordance with the
operator operation have already been written, the recorded content elements not
to be outputted or to be outputted together with the information that the
expiration date has expired, when the expiration date of said content elements
has expired or if the version is not up to date.

52. The digital broadcast system according to Claim 50, wherein
the optimization processing performed by the restoring portion of said
receiver causes, in the case where desired content elements determined in
accordance with the operator operation have already been written, the recorded
20 content elements not to be outputted, and allows for selecting a desired content
element from a transmitted set of content elements to restore and output the
same, when the expiration date of said content elements has expired or if the
version is not up to date.

53. The digital broadcast system according to Claim 48, wherein
the optimization processing performed by said restoring portion performs
a comparison between a version transmitted associated with content elements
and a version already recorded or a comparison between current date and time
and expiration date already recorded, and, if the expiration date has expired or
30 the version is not up to date, then allows again for restoring transmitted content
elements for recording thereof.

54. The digital broadcast system according to Claim 48, wherein
said restoring portion receives information regarding whether or not a
new set of content elements or content elements having a subsequent version or
5 subsequent expiration date is to be transmitted, and determines whether or not
a new set of content elements is or content elements are restored, in accordance
with said information.

55. A digital broadcast receiver comprising
10 a receiving portion for receiving transport streams,
an operation receiving portion for receiving an operator operation,
a transport decoder for selecting at least desired navigation control data
and content elements from received transport streams in accordance with the
operator operation for output,

15 an extending decoder for extending output from the transport decoder,
a CPU for controlling each aforementioned portion,
a memory which records a program for determining control contents of
said CPU, and

a recording portion for recording;

20 said digital broadcast receiver wherein

said program allows the CPU to perform

processing for determining content elements to be restored next based
on the operation received by the operation receiving portion in accordance with
the navigation control data, separating the content elements to be restored next
25 out of sets of content elements transmitted repeatedly by means of the transport
decoder, and restoring and outputting the same by extending the same by means
of the extending decoder;

processing, carried out in parallel to said processing, for restoring content
elements other than contents to be restored next and recording the same in the
30 recording portion; and

processing for outputting content elements which have been restored in

advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

56. A recording medium which records a program for allowing a CPU to perform reception processing; the CPU controlling a receiving portion for receiving transport streams, an operation receiving portion for receiving an operator operation, a transport decoder for selecting at least desired navigation control data and content elements from received transport streams in accordance with the operator operation for output, an extending decoder for extending output from the transport decoder, and a recording portion for recording;

said recording medium for recording a program which allows the CPU to perform

processing for determining content elements to be restored next based on the operation received by the operation receiving portion in accordance with the navigation control data, separating the content elements to be restored next out of sets of content elements transmitted repeatedly by means of the transport decoder, and restoring and outputting the same by extending the same by means of the extending decoder;

processing, carried out in parallel to said processing, for restoring content elements other than contents to be restored next and recording the same in the recording portion; and

processing for outputting content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

57. A digital broadcast transmitter which transmits a set of linked content elements,

said digital broadcast transmitter

transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation

control data for controlling to determine which one of a plurality of content elements to output, and

transmitting a whole set of content elements or individual content elements, associated with an expiration date or version.

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58. A digital broadcast method which allows a set of linked content elements to be broadcast from a transmitting side and which allows a content element at a receiving side to be selected out of a transmitted set of content elements for output and a viewer to switch to content elements selected in response to the viewer operation input,

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said digital broadcast method comprising the steps of:

transmitting said set of content elements repeatedly with a plurality of content elements as one set, and

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transmitting repeatedly one or more navigation control data for controlling to determine which one of a plurality of content elements to transmit, at said transmitting side;

receiving transmitted data,

determining which content element to restore next based on the operation of the viewer and in accordance with the navigation control data,

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selecting a content element to be restored next out of content elements transmitted repeatedly,

restoring and outputting the element; as well as

performing processing of restoring and recording other content elements in parallel with processing of selecting and restoring a desired content element determined based on the operation input by the operator, and

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outputting content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

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59. A digital broadcast system allowing a transmitter to broadcast a set of content elements linked to one another by descriptions of the content elements

themselves, a receiver to select a content element from a set of transmitted content elements for output, and a viewer to switch to a content element selected in response to an operation input by the viewer;

5 said digital broadcast system comprising a transmitter and a receiver,
 said transmitter transmitting said sets of content elements repeatedly with
 a plurality of content elements as one set, and
 said receiver comprising
 a receiving portion for receiving transmitted data,
 an operation receiving portion for receiving an operator operation, and
10 a restoring portion for determining which content element to restore next
 based on the operation received by the operation receiving portion and in
 accordance with link information in the content elements, for selecting a content
 element to be restored next out of content elements transmitted repeatedly, and
 for restoring the element for output; wherein
15 said restoring portion performs processing of restoring and recording
 other content elements in parallel with processing of selecting and restoring a
 desired content element determined based on the operation input by the
 operator, and outputs content elements which have been restored in advance
 and recorded, in the case where content elements determined based on the
20 operation input by the operator have already been recorded.

60. A digital broadcast receiver which allows a viewer to switch to content
 elements selected in response to an operation input by the viewer,
 said digital broadcast receiver comprising
25 a receiving portion for receiving transmitted data,
 an operation receiving portion for receiving an operator operation, and
 a restoring portion for determining which content element to restore next
 based on the operation received by the operation receiving portion and in
 accordance with link information in the content elements, for selecting a content
30 element to be restored next out of content elements transmitted repeatedly, and
 for restoring the element for output, in a receiving mode; wherein

said restoring portion performs processing of restoring and recording other content elements in parallel with processing of selecting and restoring a desired content element determined based on the operation input by the operator, and outputs content elements which have been restored in advance and recorded, in the case where content elements determined based on the operation input by the operator have already been recorded.

61. The digital broadcast system according to Claim 29, wherein said transmitter transmits recording process information that is basis for judging whether the recording process is carried out or not at the receiver, associated with a whole set of content elements, individual content elements, a whole set of navigation control data or individual navigation control data.

62. The digital broadcast system according to Claim 61, wherein said transmitter transmits recording necessity information that show whether the recording process is necessary or not.

63. The digital broadcast system according to Claim 61, wherein said transmitter transmits frequency information of revising version.

64. The digital broadcast receiver according to Claim 40, wherein said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of recording process information sent from the transmitter.

65. The digital broadcast receiver according to Claim 64, wherein said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of recording necessity information sent from the transmitter.

66. The digital broadcast receiver according to Claim 65, wherein

said restoring portion judging whether the content element or the navigation control data should be recorded or not, in the basis of frequency information of revising version sent from the transmitter.

- 5 67. A digital broadcast transmitter which transmits a set of linked content elements,

said digital broadcast transmitter

- transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation
10 control data for controlling to determine which one of a plurality of content elements to output, and

associating recording process information with sets of content elements or individual content element for transmission thereof.

- 15 68. A carrier wave carrying a set of linked content elements,

said carrier wave transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output; and

- 20 associating a content element list which shows a list of content elements included in the sets of content elements with the sets of content elements and transmitting the content element list.

69. A carrier wave carrying a set of linked content elements,

- 25 said carrier wave transmitting said sets of content elements repeatedly with a plurality of content elements as one set, and transmitting repeatedly one or more navigation control data for controlling to determine which of a plurality of content elements to output; and

- transmitting a whole set of content elements or individual content
30 elements, associated with an expiration date or version.